



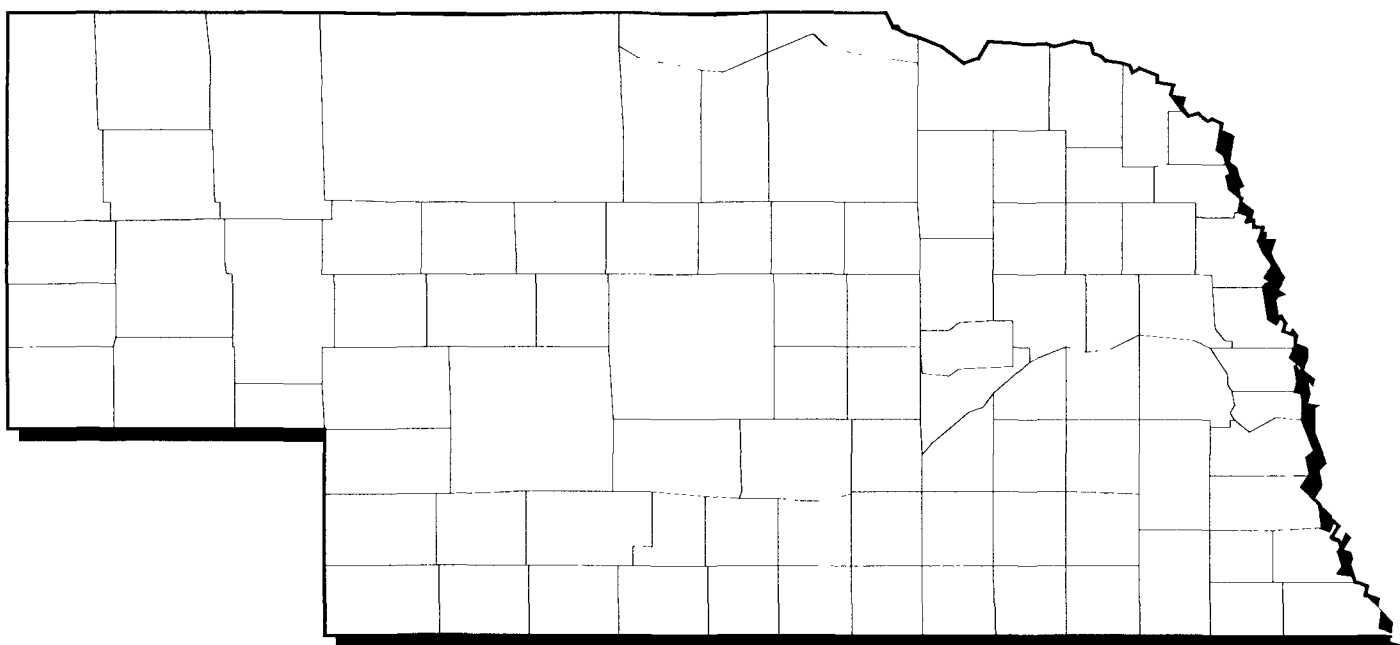
United States
Environmental Protection
Agency

Solid Waste And
Emergency Response
(5102 G)

EPA/540/R-93/026
December 1992
PB93-963227

SUPERFUND:

**Progress at
National
Priority
List Sites**



NEBRASKA 1992 UPDATE



Printed on Recycled Paper

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The complete set of the 49 State reports may be ordered as PB93-963250.

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INTRODUCTION

A BRIEF OVERVIEW OF SUPERFUND

During the second half of the Twentieth Century, the environmental consequences of more than 100 years of industrialization in the United States became increasingly clear. Authors such as Rachel Carson wrote passionately about the often-hidden environmental effects of our modern society's widespread use of chemicals and other hazardous materials. Their audience was small at first, but gradually their message spread. Growing concern turned to action, as people learned more about the environment and began to act on their knowledge.

The 1970s saw environmental issues burst onto the national scene and take hold in the national consciousness. The first Earth Day was observed in 1970, the year that the U.S. Environmental Protection Agency (EPA) was founded. By the end of the 1970s, Love Canal in New York and the Valley of the Drums in



Kentucky had entered the popular lexicon as synonyms for pollution and environmental degradation.

Superfund Is Established

The industrialization that gave Americans the world's highest standard of living also created problems that only a national program could address. By 1980, the U.S. Congress had passed numerous environmental laws, implemented by the EPA, but many serious hazardous waste problems were slipping through the cracks.

Responding to growing concern about public health and environmental threats from uncontrolled releases of hazardous materials, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Popularly known as Superfund, CERCLA had one seemingly simple job—to uncover and clean up hazardous materials spills and contaminated sites.

A Big Job

Few in Congress, the EPA, the environmental community, or the general public knew in 1980 just how big the nation's hazardous materials problem is. Almost everyone thought that Superfund would be a short-lived program requiring relatively few resources to clean up at most a few hundred sites. They were quite mistaken.

As the EPA set to work finding sites and gauging their potential to harm people and the environment, the number of sites grew. Each discovery seemed to lead to another, and today almost 36,000 hazardous waste sites have been investigated as potential hazardous waste sites. They are catalogued in the EPA's computerized database, CERCLIS (for the Comprehensive Environmental Re-

INTRODUCTION

sponse, Compensation, and Liability Information System).

The damage to public health and the environment that each site in CERCLIS might cause is evaluated; many sites have been referred to State and local governments for cleanup. The EPA lists the nation's most serious hazardous waste sites on the National Priorities List, or NPL. (These Superfund sites are eligible for federally-funded cleanup, but whenever possible the EPA makes polluters pay for the contamination they helped create.) The NPL now numbers 1,275 sites, with 50 to 100 added each year. By the end of the century, the NPL may reach as many as 2,100 sites.

Superfund faces some of the most complex pollution problems ever encountered by an environmental program. Improperly stored or disposed chemicals and the soil they contaminate are one concern. More difficult to correct are the wetlands and bays, and the groundwater, lakes, and rivers often used for drinking water that are contaminated by chemicals spreading through the soil or mixing with

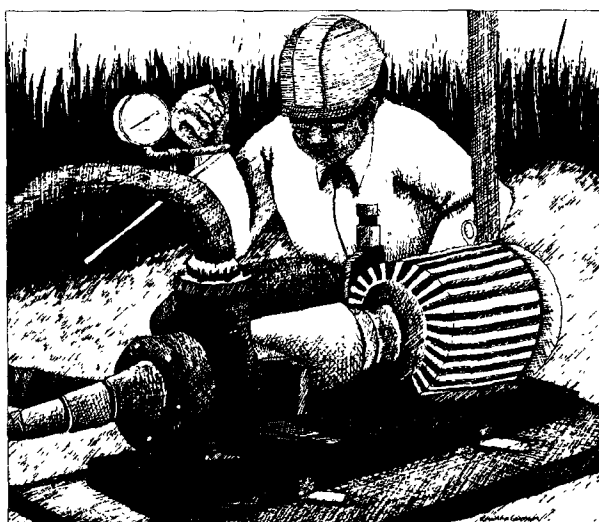
storm water runoff. Toxic vapors contaminate the air at some sites, threatening the health of people living and working near by.

Superfund aims to control immediate public health and environmental threats by tackling the worst problems at the worst sites first. Wherever possible, Superfund officials use innovative treatment techniques—many developed or refined by the EPA—to correct hazardous materials problems once and for all. Many of the treatment techniques they use did not exist when the program was created.

The EPA Administrator had challenged Superfund to complete construction necessary for cleanup work at 130 NPL sites by the end of the 1992 federal fiscal year. By September 30, 1992, the end of fiscal year 1992, construction had been completed at a total of 149 NPL sites. Superfund is well on its way of meeting the Administrator's goal of completing construction at 200 NPL sites by the end of fiscal year 1993, and 650 sites by the end of fiscal year 2000.

Quick Cleanup at Non-NPL Sites

Long-standing hazardous waste sites are not Superfund's only concern. The EPA also responds to hazardous spills and other emergencies, hauling away chemicals for proper treatment or disposal. Superfund teams perform or supervise responses at rail and motor vehicle accidents, fires, and other emergencies involving hazardous substances. They also evacuate people living and working near by, if necessary, and provide clean drinking water to people whose own water is contaminated. Removal crews also post warning signs and take other precautions to keep people and animals away from hazardous substances.



Superfund employee prepares equipment for groundwater treatment.

INTRODUCTION

Quick Cleanups, or Removals, are not limited to emergencies. When cleanup crews at contaminated sites find hazardous substances that immediately threaten people or the environment, they act right away to reduce the threat or to remove the chemicals outright. As the EPA implements the Superfund Accelerated Cleanup Model (SACM), more and more sites will undergo quick cleanups, and many of these will be cleaned up completely without ever being included on the NPL. (See "Streamlining Superfund: The Superfund Accelerated Cleanup Model.")

Some of Superfund's most significant gains in public health and environmental protection have been won by the removal program. As of March 31, 1992, the Emergency Response



Superfund employee removing drums from a Superfund site.

Program had logged more than 2,300 removal completions since Superfund was established.

The Public's Role

Superfund is unique among federal programs in its commitment to citizen participation. Although the EPA is responsible for determining how dangerous a site is and how best to clean it up, the Agency relies on citizen input as it makes these decisions.

Community residents are often invaluable sources of information about a hazardous waste site, its current and previous owners, and the activities that took place there. Such information can be crucial to experts evaluating a site and its potential dangers.

Residents also comment on EPA cleanup plans by stating their concerns and preferences at public meetings and other forums and in formal, written comments to Agency proposals. The EPA takes these comments and concerns seriously, and has modified many proposals in response to local concerns. For, ultimately, it is the community and its citizens that will live with the results of the EPA's decisions and actions; it is only fair that citizens participate in the process.

A Commitment to Communication

The Superfund program is very serious about public outreach and communication. Community relations coordinators are assigned to each NPL site to help the public understand the potential hazards present, as well as the cleanup alternatives. Local information repositories, such as libraries or other public buildings, have been established near each NPL site to ensure that the public has an opportunity to review all relevant information and the proposed cleanup plans.

The individual State volumes contain summary fact sheets on NPL sites in each State and territory. Together, the fact sheets provide a concise report on site conditions and the progress made toward site cleanups as of March 1992. The EPA revises these volumes periodically to provide an up-to-date record of program activities. A glossary of key terms relating to hazardous waste management and Superfund site cleanup is provided at the back of this book.

INTRODUCTION

Superfund is, of course, a public program, and as such it belongs to everyone of us. This volume, along with other State volumes, comprises the EPA's report on Superfund progress to the program's owners for the year 1992.

STREAMLINING SUPERFUND: THE SUPERFUND ACCELERATED CLEANUP MODEL

Historically, critics and supporters alike have measured Superfund's progress by the number of hazardous waste sites deleted from the NPL. Although easy enough to tally, this approach is too narrow. It misses the major gains Superfund makes by reducing major risks at the nation's worst hazardous sites long before all clean-up work is done and the site deleted. It also ignores the Removal Program's contributions to meeting Superfund's twin mandates of maximizing public health and environmental protection.

Renewing Superfund's commitment to rapid protection from hazardous materials, the EPA is streamlining the program. The Superfund Accelerated Cleanup Model, or SACM, will take Early Actions, such as removing hazardous wastes or contaminated materials, while experts study the site. SACM also will combine similar site studies to reduce the time required to evaluate a site and its threats to people and the environment. This way, immediate public health and environmental threats will be addressed while long-term cleanups are being planned.

Emergencies such as train derailments and motor vehicle accidents will continue to be handled expeditiously. Teams of highly trained technicians will swing into action right away, coordinating the cleanup and removal of hazardous substances to ensure public safety as quickly as possible.

Breaking With Tradition

The traditional Superfund process begins with a lengthy phase of study and site assessment, but SACM will save time by combining separate, yet similar, activities. Each EPA Region will form a Decision Team of site managers,

risk assessors, community relations coordinators, lawyers, and other experts to monitor the studies and quickly determine whether a site requires Early Action (taking less than five years), Long-term Action, or both.

While the site studies continue, the Decision Team will begin the short-term work required to correct immediate public health or environmental threats from the site. Besides removing hazardous materials, Early Actions include taking precautions to keep contaminants from moving off the site and restricting access to the site. Early Actions could eliminate most human risk from these sites, and Superfund will further focus its public participation and public information activities on site assessment and Early Action.

Long-Term Solutions

While Early Actions can correct many hazardous waste problems—and provide the bulk of public health and environmental protection—some contamination will take longer to correct. Cleanups of mining sites, wetlands, estuaries, and projects involving incineration of contaminants or restoration of groundwater can take far longer than the three to five years envisioned for Early Actions. Under SACM, these sites will be handled much as they are now.

Also under SACM, the EPA will continue its pursuit of potentially responsible parties who may have caused or contributed to site contamination. Expedited enforcement and procedures for negotiating potentially responsible party settlements will secure their participation. Superfund personnel will continue to oversee clean-up work performed by potentially responsible parties.

INTRODUCTION

HOW SUPERFUND WORKS

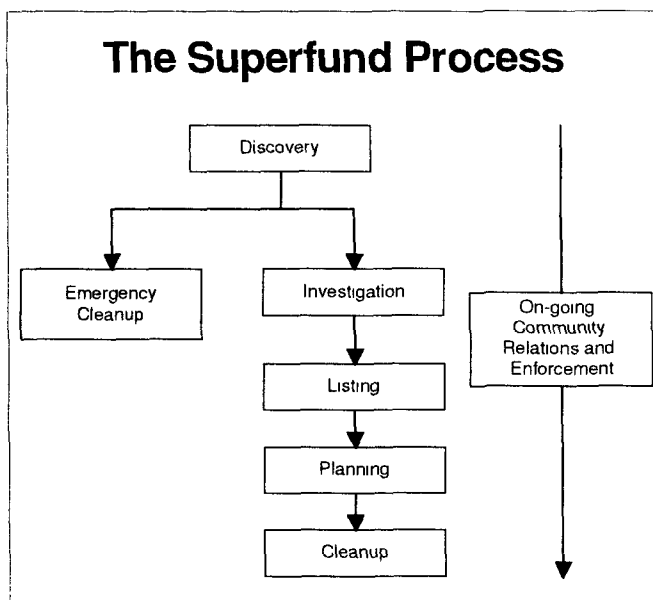
Each Superfund site presents a different set of complex problems. The same hazardous materials and chemicals often contaminate many sites, but the details of each site are different. Almost always, soil is contaminated with one or more chemicals. Their vapors may taint the air over and around the site. Contaminants may travel through the soil and reach underground aquifers which may be used for drinking water, or they may spread over the site to contaminate streams, ponds, and wetlands. The contaminating chemicals may interact with each other, presenting even more complicated cleanup problems.

Superfund's cleanup process is arduous and exacting. It requires the best efforts of hundreds of experts in science and engineering, public health, administration and management, law, and many other fields.

The average NPL site takes from seven to ten years to work its way through the system, from discovery to the start of long-term cleanup. Actual cleanup work can take years, decades if contaminated groundwater must be treated. Of course, imminent threats to public health or the environment are corrected right away.

The diagram to the right presents a simplified view of the cleanup process. The major steps in the Superfund process are:

- Detailed studies to determine whether conditions are serious enough to add the site to the National Priorities List of sites eligible for federally funded cleanup under Superfund;
 - Selection, design, and implementation of a cleanup plan, after a thorough review of the most effective cleanup options, given site conditions, contaminants present, and their potential threat to public health or the environment.
 - Follow-up to ensure that the cleanup work done at the site continues to be effective over the long term.
- Site discovery and investigation to identify contaminants and determine whether emergency action is required;
 - Emergency site work such as removing contaminants for proper treatment or disposal, and securing the site to keep people and animals away, if warranted by conditions at the site;
 - Site evaluation to determine how people living and working nearby, and the environment, may be exposed to site contaminants;



From the earliest stages, EPA investigators work hard to identify those responsible for the contamination. As their responsibility is established, the EPA negotiates with these “responsible parties” to pay for cleaning up the problem they helped create. This “enforcement first” policy saves Superfund Trust Fund monies for use in cleanups where the responsible parties cannot be identified, or where they are unable to fund cleanup work.

THE VOLUME

How to Use the State Book

The site fact sheets presented in this book are comprehensive summaries that cover a broad range of information. The fact sheets describe hazardous waste sites on the NPL and their locations, as well as the conditions leading to their listing ("Site Description"). The summaries list the types of contaminants that have been discovered and related threats to public and ecological health ("Threats and Contaminants"). "Cleanup Approach" presents an overview of the cleanup activities completed, underway, or planned. The fact sheets conclude with a brief synopsis of how much progress has been made in protecting public health and the environment. The summaries also pinpoint other actions, such as

legal efforts to involve polluters responsible for site contamination and community concerns.

The fact sheets are arranged in alphabetical order by site name. Because site cleanup is a dynamic and gradual process, all site information is accurate as of the date shown on the bottom of each page. Progress always is being made at NPL sites, and the EPA periodically will update the site fact sheets to reflect recent actions and will publish updated State volumes. The following two pages show a generic fact sheet and briefly describe the information under each section.

How Can You Use This State Book?

You can use this book to keep informed about the sites that concern you, particularly ones close to home. The EPA is committed to involving the public in the decision making process associated with hazardous waste cleanup. The Agency solicits input from area residents in communities affected by Superfund sites. Citizens are likely to be affected not only by hazardous site conditions, but also by the remedies that combat them. Site cleanups take many forms and can affect communities in different ways. Local traffic may be rerouted, residents may be relocated, temporary water supplies may be necessary.

Definitive information on a site can help citizens sift through alternatives and make decisions. To make good choices, you must know what the threats are and how the EPA

intends to clean up the site. You must understand the cleanup alternatives being proposed for site cleanup and how residents may be affected by each one. You also need to have some idea of how your community intends to use the site in the future, and you need to know what the community can realistically expect once the cleanup is complete.

The EPA wants to develop cleanup methods that meet community needs, but the Agency only can take local concerns into account if it understands what they are. Information must travel both ways in order for cleanups to be effective and satisfactory. Please take this opportunity to learn more, become involved, and assure that hazardous waste cleanup at "your" site considers your community's concerns.

THE VOLUME

SITE NAME		EPA REGION XX	
STATE		COUNTY NAME	
EPA ID# ABC0000000		LOCATION	
		Other Names:	
NPL LISTING HISTORY Provides the dates when the site was Proposed, made Final, and Deleted from the NPL.	Site Description	A	
	Site Responsibility:		
SITE RESPONSIBILITY Identifies the Federal, State, and/or potentially responsible parties taking responsibility for cleanup actions at the site.	Threats and Contaminants	B	
	Cleanup Approach		
ENVIRONMENTAL PROGRESS Summarizes the actions to reduce the threats to nearby residents and the surrounding environment and the progress towards cleaning up the site.	Response Action Status	D	
	Site Facts:		
	Environmental Progress	E	
Site Repository			

SITE REPOSITORY
Lists the location of the primary site repository. The site repository may include community relations plans, public meeting announcements and minutes, fact sheets, press releases, and other site-related documents.

A**SITE DESCRIPTION**

This section describes the location and history of the site. It includes descriptions of the most recent activities and past actions at the site that have contributed to the contamination. Population estimates, land usages, and nearby resources give readers background on the local setting surrounding the site.

B**THREATS AND CONTAMINANTS**

The major chemical categories of site contamination are noted, as well as which environmental resources are affected. Icons representing each of the affected resources (may include air, groundwater, surface water, soil, and contamination to environmentally sensitive areas) are included in the margins of this section. Potential threats to residents and the surrounding environments arising from the site contamination also are described.

C**CLEANUP APPROACH**

This section contains a brief overview of how the site is being cleaned up.

D**RESPONSE ACTION STATUS**

Specific actions that have been accomplished or will be undertaken to clean up the site are described here. Cleanup activities at NPL sites are divided into separate phases, depending on the complexity and required actions at the site. Two major types of cleanup activities often are described: initial, immediate, or emergency actions to quickly remove or reduce imminent threats to the community and surrounding areas; and long-term remedial phases directed at final cleanup at the site. Each stage of the cleanup strategy is presented in this section of the summary. Icons representing the stage of the cleanup process (initial actions, site investigations, EPA selection of the cleanup remedy, engineering design phase, cleanup activities underway, and completed cleanup) are located in the margin next to each activity description.

E**SITE FACTS**

Additional information on activities and events at the site are included in this section. Often details on legal or administrative actions taken by the EPA to achieve site cleanup or other facts pertaining to community involvement with the site cleanup process are reported here.

THE VOLUME

The “icons,” or symbols, accompanying the text allow the reader to see at a glance which environmental resources are affected and the status of cleanup activities at the site.

Icons in the Threats and Contaminants Section



Contaminated *Groundwater* resources in the vicinity or underlying the site. (Groundwater is often used as a drinking water source.)



Contaminated *Surface Water and Sediments* on or near the site. (These include lakes, ponds, streams, and rivers.)



Contaminated *Air* in the vicinity of the site. (Air pollution usually is periodic and involves contaminated dust particles or hazardous gas emissions.)



Contaminated *Soil and Sludges* on or near the site. (This contamination category may include bulk or other surface hazardous wastes found on the site.)



Threatened or contaminated *Environmentally Sensitive Areas* in the vicinity of the site. (Examples include wetlands and coastal areas or critical habitats.)

Icons in the Response Action Status Section



Initial, Immediate, or Emergency Actions have been taken or are underway to eliminate immediate threats at the site.



Site Studies at the site to determine the nature and extent of contamination are planned or underway.



Remedy Selected indicates that site investigations have been concluded, and the EPA has selected a final cleanup remedy for the site or part of the site.



Remedy Design means that engineers are preparing specifications and drawings for the selected cleanup technologies.

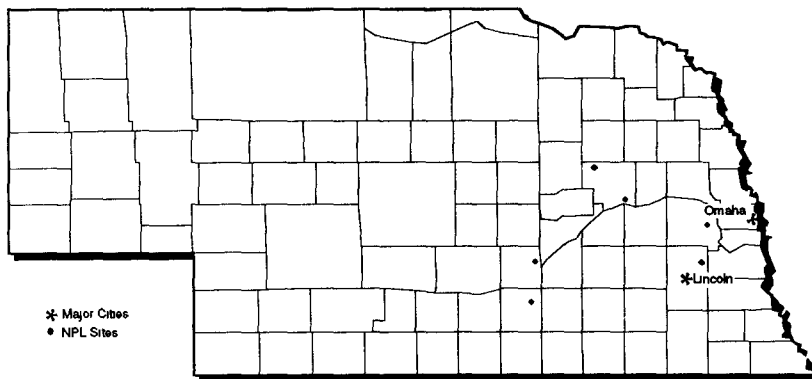


Cleanup Ongoing indicates that the selected cleanup remedies for the contaminated site, or part of the site, currently are underway.



Cleanup Complete shows that all cleanup goals have been achieved for the contaminated site or part of the site.

A SUMMARY OF THE STATE PROGRAM



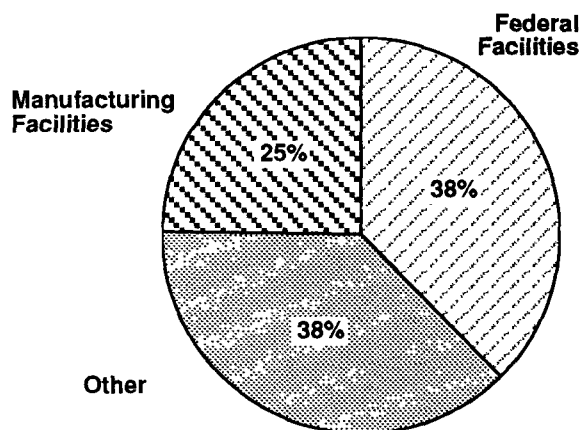
Superfund Activities in Nebraska

The State of Nebraska is located within EPA Region 7, which includes the four central States. The State covers 77,355 square miles. According to the 1990 Census, Nebraska experienced a 5 percent increase in population between 1980 and 1990, and is ranked thirty-six in U.S. population with approximately 1,578,000 residents.

The Nebraska Environmental Protection Act does not cover Superfund sites specifically; however, Title 118, of the Act prohibits the pollution of groundwater and sets standards for cleanup. Under Title 118, the State has the authority to issue administrative orders and injunctions against polluters and to seek judicial civil penalties. These enforcement authorities compel polluters to conduct or pay for cleanup activities. Citizen suits also may be pursued against large solid waste disposal violators. No additional cleanup funding is provided by the State beyond the 10 percent contribution from the State required by the Federal Superfund program. Public notice of the polluter's proposed cleanup plan is provided by newspaper and radio, with copies available in public libraries. A 30-day public comment period is required as part of the decision making process. Currently, six sites in the State of Nebraska have been listed as final on the NPL. Two new sites were proposed for listing in 1992.

The Department of Environmental Quality implements the Superfund Program in the State of Nebraska

Activities responsible for hazardous waste contamination in the State of Nebraska include:



Facts about the eight NPL sites in Nebraska:



Immediate Actions (such as removing hazardous substances or restricting site access) were performed at six sites.



No site endangers sensitive environments.

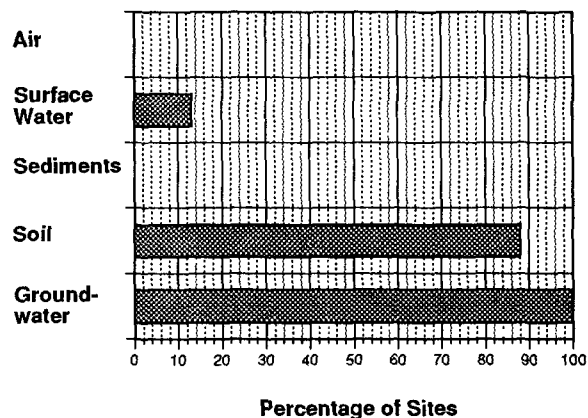


Six sites are located near residential areas.

NEBRASKA

Most Sites Have Multiple Contaminants and Contaminated Media:

Media Contaminated at Sites



Contaminants Found at Sites

Percentage of Sites	
VOCs	88%
Heavy Metals	50%
Petrochemicals/Explosives	38%
PCBs	13%
Creosotes	13%
Other*	13%

*Other contaminants include nitrates and sulfates.

The Potentially Responsible Party Pays...

In the State of Nebraska, potentially responsible parties are paying for or conducting cleanup activities at three sites.

For Further Information on NPL Sites and Hazardous Waste Programs in the State of Nebraska Please Contact:

☎ EPA Region 7 Public Affairs Office	For information concerning community involvement	(913) 551-7003
☎ National Response Center	To report a hazardous waste emergency	(800) 424-8802
☎ Department of Environmental Quality: Hazardous Waste Section, Superfund Unit	For information about the State's responsibility in the Superfund Program	(402) 471-3388
☎ EPA Region 7 Waste Management Division: Superfund Branch	For information about the Regional Superfund Program	(913) 551-7062
☎ EPA Superfund Hotline	For information about the Federal Superfund Program	(800) 424-9068

THE NPL REPORT

PROGRESS TO DATE

The following Progress Report lists all sites currently on, or deleted from, the NPL and briefly summarizes the status of activities for each site at the time this report was prepared. The steps in the Superfund cleanup process are arrayed across the top of the chart, and each site's progress through these steps is represented by an arrow (⇒) indicating the current stage of cleanup.

Large and complex sites often are organized into several cleanup stages. For example, separate cleanup efforts may be required to address the source of the contamination, hazardous substances in the groundwater, and surface water pollution, or to clean up different areas of a large site. In such cases, the chart portrays cleanup progress at the site's *most advanced* stage, reflecting the status of site activities rather than administrative accomplishments.

- ⇒ An arrow in the "Initial Response" category indicates that an emergency cleanup, immediate action, or initial action has been completed or currently is underway. Emergency or initial actions are taken as an interim measure to provide immediate relief from exposure to hazardous site conditions or to stabilize a site to prevent further contamination.
- ⇒ A final arrow in the "Site Studies" category indicates that an investigation to determine the nature and extent of the contamination at the site currently is ongoing or planned.
- ⇒ A final arrow in the "Remedy Selection" category means that the EPA has selected the final cleanup strategy for the site. At the few sites where the EPA has

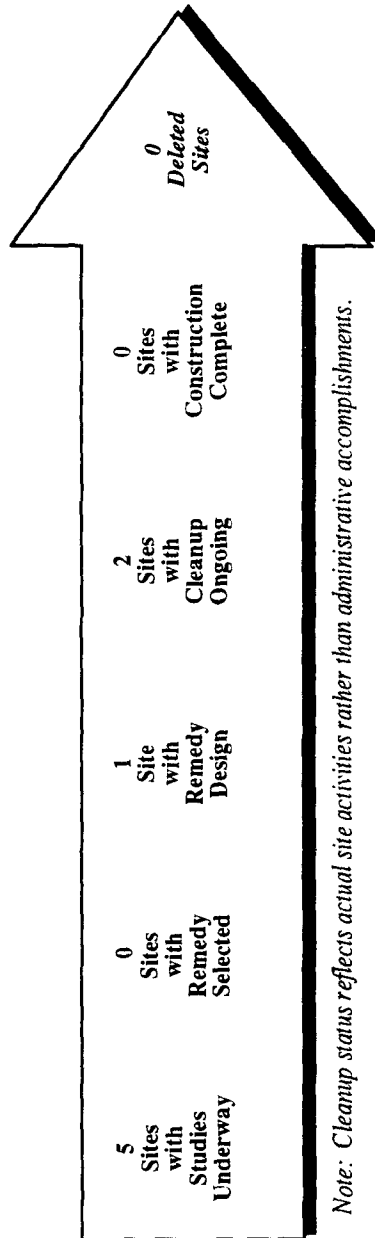
determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy has been selected. In these cases, the arrows are discontinued at the "Remedy Selection" step and resume in the "Construction Complete" category.

- ⇒ A final arrow at the "Remedial Design" stage indicates that engineers currently are designing the technical specifications for the selected cleanup remedies and technologies.
- ⇒ A final arrow in the "Cleanup Ongoing" column means that final cleanup actions have been started at the site and currently are underway.
- ⇒ A final arrow in the "Construction Complete" category is used only when all phases of the site cleanup plan have been performed, and the EPA has determined that no additional construction actions are required at the site. Some sites in this category currently may be undergoing long-term operation and maintenance or monitoring to ensure that the cleanup actions continue to protect human health and the environment.
- ✓ A check in the "Deleted" category indicates that the site cleanup has met all human health and environmental goals and that the EPA has deleted the site from the NPL.

Further information on the activities and progress at each site is given in the site "Fact Sheets" published in this volume.

Progress Toward Cleanup at NPL Sites in the State of Nebraska

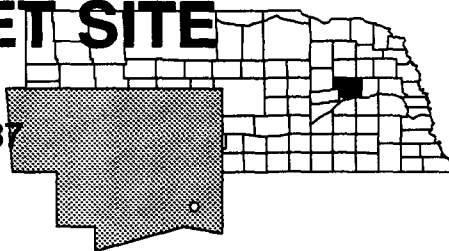
Site Name	County	NPL Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete	Deleted
CLEBURN STREET WELL	HALL	Proposed 02/07/90	⇒	⇒					
CORNHUSKER ARMY AMMUNITION PLANT	HALL	Final 07/22/87	⇒	⇒					
HASTINGS GROUNDWATER CONTAMINATION	ADAMS/CLAY	Final 06/10/86		⇒	⇒	⇒	⇒		
LINDSAY MANUFACTURING CO.	PLATTE	Final 10/04/89	⇒	⇒	⇒	⇒			
NEBRASKA ARMY ORDNANCE PLANT	SAUNDERS	Final 08/30/90	⇒	⇒					
SHERWOOD MEDICAL CO.	MADISON	Proposed 07/29/91	⇒	⇒					
WAVERLY GROUNDWATER CONTAMINATION	LANCASTER	Final 06/10/86	⇒	⇒	⇒	⇒	⇒		
10TH STREET SITE	PLATTE	Final 08/30/90		⇒					



Note: Cleanup status reflects actual site activities rather than administrative accomplishments.

10TH STREET SITE NEBRASKA

EPA ID# NED981713837



EPA REGION 7

Platte County
Columbus

Other Names:
Columbus Public Water Supply

Site Description

The 10th Street Site consists of nine municipal wells located in and around the City of Columbus. The EPA conducted a soil gas survey in 1988 and found that four of the wells are contaminated with volatile organic compounds (VOCs). The highest contaminant level was detected under a city parking lot that formerly was used as a scrap metal yard. Among potential sources of soil contamination are a dry cleaning facility behind the lot and a laundromat. The municipal wells within 3 miles of the site provide drinking water to approximately 18,600 people. All the wells use the shallow aquifer, which is known to have been contaminated, as their water source.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY

Proposed Date: 10/26/89

Final Date: 08/30/90

Threats and Contaminants



The groundwater serving municipal wells is contaminated with VOCs. VOCs also have been found in the soil. People could be exposed to VOC's through use of the municipal water supply. Additional exposure is possible if private wells are installed and used in areas of high levels of groundwater contamination.

Cleanup Approach

This site is being addressed in a single long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Entire Site: The EPA has begun an investigation of the site to evaluate the nature and extent of contamination. The EPA is considering a remedy to contain groundwater contamination. After completion of the investigation, scheduled for late 1992, the EPA will be able to determine the best methods for the site cleanup.

Environmental Progress



After adding this site to the NPL, the EPA performed preliminary investigations and determined that no immediate actions were required at the 10th Street Site while studies are taking place and cleanup activities are being planned.

Site Repository

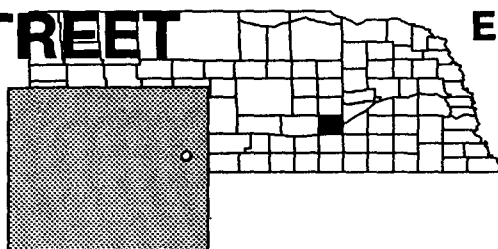


Contact the Region 7 Superfund Community Relations Office.

CLEBURN STREET WELL

NEBRASKA

EPA ID# NED981499312



EPA REGION 7

Hall County
Grand Island

Site Description

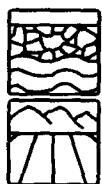
The Cleburn Street well was once a drinking water source for the City of Grand Island. The municipal water system, serving 38,500 people, consists of 12 wells within city limits and 12 wells in the Platte River Island Well field southeast of the city. Now disconnected from the municipal water supply, the contaminated Cleburn Street well was found to be contaminated by tetrachloroethylene (PCE) in 1986. Subsequent studies indicated PCE-contamination in other Grand Island municipal wells, as well as in the soil of three areas on site. EPA is currently investigating potential sources of the well contamination. One potential source results from operations conducted at the Nebraska Solvent Co. Three local dry cleaners are also thought to be potential sources of contamination. All four operations have used and stored chlorinated solvents. The EPA's search for additional sources of well contamination continues. Some 1,100 residents not served by the municipal water system draw water from shallow private wells. The Cleburn Street Well is within 4 miles of food and forage crops irrigated by 333 wells.

Site Responsibility: This site is being addressed by Federal actions.

NPL LISTING HISTORY

Proposed Date: 07/29/91

Threats and Contaminants



PCE and other volatile organic compounds (VOCs) were first discovered in the Cleburn Street well in 1986 and later in other wells of the municipal water system. PCE was also detected in on-site soils.

Cleanup Approach

The site is being addressed in two stages: immediate actions and one long-term remedial phase focusing on cleaning up the entire site

Response Action Status



Immediate Actions: The Cleburn Street well was disconnected from the municipal water supply in 1986.



Entire Site: The EPA conducted a soil-gas investigation in 1988. PCE and other volatile organic compounds (VOCs) were detected in three areas on site. Site-wide investigations into the nature and extent of groundwater and soil contamination were initiated in 1991 and are expected to be completed in 1993.

Site Facts: The EPA continues to search for parties potentially responsible for site contamination.

Environmental Progress



Disconnecting the contaminated Cleburn Street well from the municipal water supply has significantly reduced the risk of residents coming into contact with contaminants while site investigations are underway and cleanup activities are being planned.

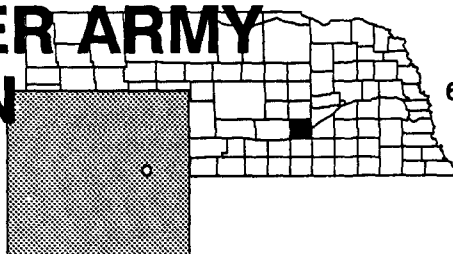
Site Repository



Not established.

CORNHUSKER ARMY AMMUNITION PLANT NEBRASKA

EPA ID# NE2213820234



EPA REGION 7
Hall County
6 miles west of Grand Island

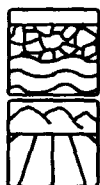
Site Description

The 19-acre Cornhusker Army Ammunition Plant is a U.S. Army Armament, Munitions, and Chemical Command facility. On standby status since 1973, the operation leases 16 square miles of land for agriculture, grazing, and wildlife management activities. The plant was built in 1942 to produce munitions and to provide support functions during World War II and has gone in and out of production over the years. It consists of five major components: (1) five major production areas where munitions were loaded, assembled, and packed; (2) a fertilizer manufactory; (3) two major storage facilities; (4) a sanitary landfill; and (5) a burn ground where materials contaminated with explosives were ignited. Activities at the site currently are limited to maintenance and leasing operations. Once the environmental studies required for real estate transactions are completed, the Army plans to sell the property. When the plant was active, staff disposed of wastewater contaminated with explosives into 56 earthen surface impoundments, which were located near the five production areas. Dried solids from the bottom of the pits periodically were scraped and ignited at the burning ground. Releases from the surface impoundments have contaminated about 500 private wells. Polluted groundwater has migrated off the site and has been detected as far as 3 1/2 miles beyond the plant's border. The area affected by groundwater contamination is mostly suburban, and residents rely on public and private wells for drinking water. Approximately 3,000 people live within 1 mile, and 27,000 live within 3 miles of the site. Groundwater also is used for farmland irrigation and for watering livestock.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY Proposed Date: 10/15/84 Final Date: 07/22/87

Threats and Contaminants



Groundwater both on and off the site are contaminated with various explosives. Soils are contaminated with various explosives and heavy metals such as lead, chromium, and cadmium. Human and livestock health can be adversely affected by drinking the contaminated groundwater or through direct contact with contaminated soil.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Immediate Actions: The Army provided bottled water to the 250 homes with contaminated wells until residences could be hooked up to the city's water system. In 1986, the municipal water system was extended to 800 residences in Grand Island. A dewatering system was completed to control the high water table. In 1987, the Army started an incineration program to treat the contaminated soil in the 56 surface impoundments. Workers excavated the soil and then incinerated it to destroy the contaminants. The excavated pits were backfilled with sand and gravel from off the site, and the ash from the incinerator was landfilled on the site. The Army had burned 40,000 tons of soil by 1988, when the State-monitored operation ended. In 1991 and 1992, The Army provided bottled water to additional homes with contaminated wells until residences can be hooked up to the city's water system. The city water system is scheduled to be extended in 1993 to meet this need.



Entire Site: An investigation by the Department of the Army in 1990 identified several areas of potential contamination. The Department of Defense (DOD) will investigate the plume of groundwater that has moved off the site to determine its shape, the types and levels of contaminants present, the extent of its threat to human health and the environment, and the appropriate cleanup standards to be sought. The fieldwork for the investigation began in December 1991. The study is scheduled for completion in late 1993.

Site Facts: Cornhusker Army Ammunition Plant is participating in the Installation Restoration Program, a specially funded program established by the DOD in 1978 to identify, investigate, and control migration of hazardous contaminants at military and other DOD facilities. An Interagency Agreement between the EPA, Nebraska Department of Environmental Control (NDEC), and the DOD was signed in 1990. Under this Agreement, the Army will investigate and clean up the site.

Environmental Progress



The extension of the municipal water supply to 800 residences and the provision of bottled water to additional homes has eliminated the potential of exposure to hazardous substances in the drinking water. The incineration of contaminated soil has reduced other pathways of contamination at the Cornhusker Army Ammunition Plant. These actions will protect the public health and the environment while further studies are conducted and cleanup activities are being planned.

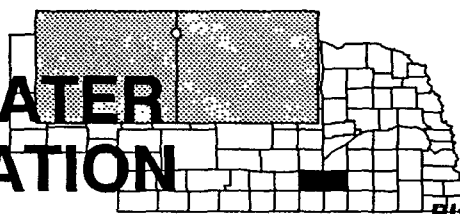
Site Repository



Grand Island Public Library, 211 North Washington Street, Grand Island, NE 68802

HASTINGS GROUND WATER CONTAMINATION NEBRASKA

EPA ID# NED980862668



EPA REGION 7

Adams County and Clay County
City of Hastings

Other Names:

Blayney Ammunition Depot
Blayney ExNaval Ammunition Base
Hastings Plume
Former Naval Ammunition Depot (NAD)

Site Description

Concerns regarding volatile organic compounds (VOCs) and other halogenated compounds in the Hastings city water supply were investigated by the State in 1983. As a result, Hastings took two municipal wells out of service and placed other contaminated wells on a standby basis. Community Municipal Services, Inc. (CMS), a private water supply system serving the areas east of Hastings, also took two of its three wells off-line due to pollution. Recent EPA testing shows that the water supplied to users by these two utilities is safe to drink. Due to the size and complexity of the Hastings site, the following site description is organized into its four geographical areas.

Hastings East Industrial Park/Former Naval Ammunition Depot (NAD). The former NAD, located about 2 miles east of Hastings, straddles two counties: Clay and Adams. The 48,000-acre NAD was used for loading armaments until the early 1950s and later for the demilling of armaments until it was decommissioned in the early 1960s. The U.S. Army Corps of Engineers is conducting studies at the site under the authorization of the Department of Defense (DOD). The Corps has discovered that explosives, heavy metals, and VOCs are the major contaminants. Although contaminants that have been detected are generally consistent with the chemicals used by the Navy operations, the industries established in the Hastings East Industrial Park (HEIP) since the 1960s may have generated some of the VOCs being detected. The portion of this investigation focusing on surface contamination on 2,600 acres of the HEIP has been completed.

The Commercial Area. This area, east of the Hastings city limits, contains the FAR-MAR-CO, TCA Contamination Area, and North Landfill subsites. FAR-MAR-CO has stored and handled agricultural products, mostly grains, for more than 30 years. VOCs, including toxic grain fumigants, have seeped into the soils and groundwater. Grain dust explosions and spills from fumigant equipment on the subsite have contributed to the problem. While investigating soils at the FAR-MAR-CO subsite, EPA discovered TCA contamination on a portion now owned by a different company. The new owner acknowledged the use of TCA as a metal cleaning solvent. This area became the TCA Contamination Area portion of the subsite. The North Landfill originally was a local brickmaker's clay pit. Hastings operated it as a landfill in the 1960s to dispose of various municipal and industrial wastes. Studies have revealed that the FAR-MAR-CO North Landfill and subsites are polluting downgradient wells with VOCs.

The Central Industrial Area. This area encompasses commercial and industrial properties situated in the heart of Hastings, along the Burlington-Northern railroad right-of-way. The three subsites that make up this area are Colorado Avenue, Second Street, and Well #3. Three different industrial solvents have been detected in soils around Colorado Avenue. The source is suspected to be industrial discharges into the storm or sanitary sewers along this street. The Second Street subsite was discovered during the 1987 to 1988 investigation of Colorado Avenue. Pollution from an old coal gas plant operation was detected in the soil at this subsite and in the downgradient groundwater. Contaminants include VOCs, polycyclic aromatic hydrocarbons (PAHs), and phenols. Well #3 is one of the city wells taken out of service because of contamination. The EPA tested in the surrounding area in 1987 and 1988, found carbon tetrachloride and chloroform in the soil and groundwater, and tentatively traced the contamination to an accidental spill of grain fumigant.

South Landfill. This landfill in southeastern Hastings was operated by the City and accepted industrial waste during the 1960s and 1970s. Contamination at this subsite consists primarily of several VOCs.

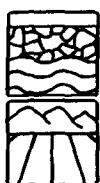
Approximately 23,000 people live in the City of Hastings. Farm and pasture surround the urban area, and 20 private and public wells lie within a 3-mile radius of the site. All residents live within that 3-mile radius. A nearby stream and lake are used for recreation. Groundwater is used to irrigate crops and water stock and provides water for home and business use.

Site Responsibility: This site is being addressed through a combination of Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY

Proposed Date: 10/15/84
Final Date: 06/10/86

Threats and Contaminants



Groundwater and soils at the various subsites are contaminated with a wide range of VOCs and other halogenated organic compounds. The NAD site is contaminated with heavy metals and explosives, in addition to VOCs, and the Second Street subsite also contains PAHs. The city water supply is safe for drinking, but people and livestock may experience adverse health effects from drinking contaminated groundwater around the subsites.

Cleanup Approach

Because of the size and complexity of the site, a number of long-term remedial phases are planned to address the overall control of contamination (source control), groundwater contamination, and soil contamination.

Response Action Status



Hastings East Industrial Park (HEIP) Surface Soils: The U.S. Army Corps of Engineers began an intensive study of groundwater contamination at this subsite in 1986. The HEIP subsite is in the former Navy Ammunition Depot. In 1988, the Corps released the results of the first part of the study, which identified sources of groundwater contamination. The report confirmed that explosives are the major contaminants at the site, along with heavy metals and VOCs. In 1990, the Corps issued a final report on this study addressing contaminated groundwater and soils. Also in 1990, a remedy was selected for the cleanup of the surface soils. The remedy recommends that soils above a predetermined cancer risk level be incinerated. Soils slightly below this level, soils of a non-carcinogenic nature, and the ash of the incinerated soils are to be stabilized and placed in an on-site landfill. A treatability study is planned as part of the design activities in 1992. The design of the soil cleanup remedy is expected to be completed for several areas in 1993. The design for the cleanup of additional soils is pending additional investigation. The vadose zone, a layer of subsurface water located above the groundwater table and groundwater contamination, will be addressed in additional phases.



Hastings East Industrial Park Groundwater and Vadose Zone: A portion of this study was completed concurrently with the study of this area's surface soils. As part of this ongoing study, the Corps issued a Groundwater Modeling Study in 1990. An addendum addressing the application of the modeling to the cleanup alternatives was issued in 1991. Additional investigations are ongoing for both groundwater and vadose contamination. A decision on cleanup remedies is expected in 1994.



North Landfill Groundwater: The EPA began an intensive study of groundwater contamination at this subsite in 1985. Workers installed three groundwater monitoring wells at the landfill and tested wells east of the site. Data revealed contamination by a variety of VOCs. In 1989, the parties potentially responsible for contamination at the landfill agreed to take over this study. This effort included recommending to the EPA the best strategies for final cleanup. In 1991 an extraction and treatment remedy was selected as an interim action until a final remedy is selected.



North Landfill Source Control: Studies were completed to determine sources of soil and groundwater contamination (see the description of "North Landfill Groundwater") and cleanup alternatives. In 1991, a soil and gas monitoring remedy was selected as an interim measure until a final remedy is selected.



FAR-MAR-CO Soil: The EPA selected a remedy for soil cleanup at this subsite in 1988. A fumigant spill resulted in contamination of about 33,800 cubic yards of soil, and the groundwater beneath it is also highly polluted. Features of the remedy include soil vapor extraction, whereby volatile chemicals are "vacuumed" from the soil without digging it up, and treating the removed vapor with activated carbon, if necessary; temporarily covering the contaminated soils to restrict contact; and monitoring soil, air, and groundwater at the site. The parties potentially responsible for site contamination began the design of the cleanup remedy in 1990. The design is planned for completion in 1992.



FAR-MAR-CO Groundwater: The potentially responsible parties are conducting an investigation of the groundwater contamination. The results of the investigation will be used to develop a technical approach for restricting the flow of contaminated groundwater beneath the site and to evaluate the need for groundwater treatment once the source of contamination is cleaned up. The potentially responsible parties, who are conducting the investigation at this subsite, relocated two residents from this subsite in 1990. The investigation is expected to be completed in 1993.



TCA Contamination Area: The parties potentially responsible for the contamination at this subsite removed the polluted soil and transported it to a licensed hazardous waste disposal facility in 1989. The same parties signed a Consent Order with the EPA and completed a study of the contamination in 1990. Based on the results of this study, the EPA has recommended that the potentially responsible parties monitor the groundwater for a period of two years.



Well #3 Soil: The EPA selected a remedy for the Well #3 subsite in 1989. It focuses on cleaning up the source of groundwater contamination. The remedy features "vacuuming" volatile contaminants from the soils, and treating the vapors with activated carbon to remove the contaminants. The EPA is working with the State in conducting the soil cleanup at the Well #3 subsite. The design of the remedy was completed in 1991, and cleanup began in 1992.



Well #3 Groundwater: Studies into the nature and extent of groundwater contamination at this subsite began in 1991 and is scheduled for completion in 1993. Cleanup activities will begin after cleanup of the source of contamination is completed (see the description of "Well #3 Soil").



Colorado Avenue Source Control: In 1988, the EPA selected a remedy for this subsite, part of the central industrial area in Hastings. The remedy focuses on cleaning up the source of groundwater contamination, 42,700 cubic yards of overlying soil polluted with VOCs. These are the soils associated with the contaminated sewers along Colorado Avenue. The remedy features "vacuuming" volatile chemicals from the soil without digging it up and treating the removed vapor with activated carbon, if necessary, and monitoring soil, air, and groundwater at the site. The parties potentially responsible for the contamination at this subsite began designing the cleanup remedy in 1988, based on a pilot study of the proposed cleanup technology. The design is expected to be completed in 1992.



Colorado Avenue Groundwater: The EPA completed a study into the nature and extent of groundwater contamination at this subsite. A groundwater report was released by the EPA in 1990. An extraction and treatment remedy addressing groundwater plume management alternatives was selected in 1991 as an interim action until a final remedy is selected.



Second Street: Additional work is needed to define the extent of groundwater contamination at this subsite. The EPA and the State currently are reviewing this subsite and its cleanup needs. The study is expected to be completed in 1994.



South Landfill: The field investigations needed to characterize the nature and extent of contamination at this subsite have been discussed with the City of Hastings and the other parties potentially responsible for its contamination. Investigations are scheduled to begin in 1992.



Yard Dump and Bomb and Mine Complex: As part of the NAD investigation, the U.S. Army Corps of Engineers is currently evaluating the nature and extent of contamination in this area. The on-going study is focusing on defining the extent of metals, volatiles and explosives contamination. The area is located along the southern boundary of the NAD, approximately one mile north of the town of Glenville.

Site Facts: The EPA and the City of Hastings entered an Administrative Order on Consent in 1989 for conducting an investigation at the North Landfill subsite. Hastings Irrigation Pipe Company and the EPA signed an Administrative Order on Consent in 1989 for a study at the TCA Contamination Area. Farmland Industries and the EPA signed an Administrative Order on Consent to conduct treatability studies and complete the remedy design for source control at the FAR-MAR-CO subsite.

Environmental Progress



Due to the numerous long-term remedial phases and locations of contaminated areas at the Hastings Ground Water Contamination site, the status of cleanup activities varies at the different subsites. In general, however, the potential for exposure to hazardous substances in the groundwater and soil has been greatly reduced by closing down contaminated wells and removing contaminated soil while further studies and cleanup activities are being planned and conducted.

Site Repository



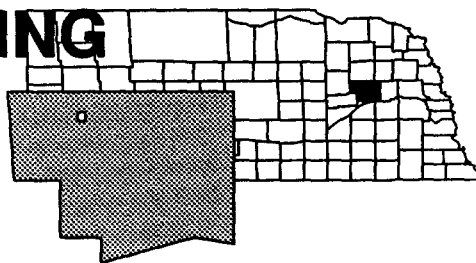
Central C.C. Library, E. U.S. Highway 6, Hastings, NE 68901

LINDSAY MANUFACTURING CO. NEBRASKA

EPA ID# NED068645696

EPA REGION 7

Platte County
Lindsay



Site Description

The Lindsay Manufacturing Company generates sulfuric acid waste from a galvanizing process at its plant. The wastes were discharged into an unlined pond for at least 15 years. The pit was closed in 1983, when three monitoring wells showed contamination. The site is surrounded by agricultural land. Approximately 3,000 people live within a 3-mile radius of the site, with the nearest residence being 300 feet away.

Site Responsibility: This site is being addressed through a combination of Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY

Proposed Date: 06/24/88

Final Date: 10/04/89

Threats and Contaminants



On-site groundwater contains heavy metals including zinc, iron, cadmium, chromium, and lead from former process wastes. Off-site groundwater contains heavy metals including cadmium, zinc, and volatile organic compounds (VOCs). VOCs also have been identified in the perched sand channel in the northern half of the site, in clay soils in the area around the northern quarter of the main plant, and between the main plant and the southern end of the galvanizing building. People could be exposed to contaminants by drinking water from contaminated private wells, by direct contact with contaminated water, by inhaling contaminants released during water use, or by eating food in which contaminants have bioaccumulated.

Cleanup Approach

This site is being addressed in two stages: initial actions and a single long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Initial Actions: In 1984, Lindsay began operating an interim pump and treat system, whereby the groundwater is treated by neutralizing and removing contaminants. The State is monitoring this groundwater restoration project. Off-site monitoring wells show that the project is controlling the migration of contaminants from the site.



Entire Site: Lindsay began a study of the nature and extent of contamination remaining at the site, as well as the alternative technologies for cleanup. The study was completed in 1990. Based on the results of the study, the EPA selected a remedy that includes a pilot study to evaluate the feasibility of vacuum extraction of on-site soils, installation of such a system if it is deemed practical, enhancement and utilization of the existing groundwater extraction and treatment systems, installation of additional groundwater monitoring wells, and continued monitoring of the groundwater collection/treatment system during cleanup activities. The design of these remedies began in 1992.

Site Facts: In April 1992, a Consent Decree was signed that requires the potentially responsible parties to design the remedy and cleanup the site under EPA monitoring.

Environmental Progress



The groundwater restoration project described above has reduced the potential for exposure to hazardous materials at the Lindsay Manufacturing site while the design of the selected remedy is underway.

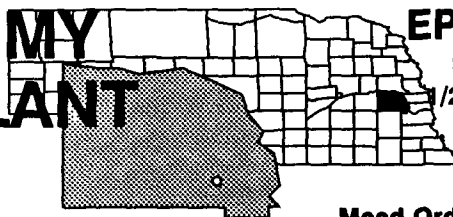
Site Repository



Columbus Public Library, 2504 14th Street, Columbus, NE 68801

NEBRASKA ARMY ORDNANCE PLANT NEBRASKA

EPA ID# NE6211890011



EPA REGION 7

Saunders County
1/2 mile east of Mead

Other Names:
Mead Ordnance Plant University of
Nebraska, Mead Field Laboratory

Site Description

The 17,000-acre Nebraska Army Ordnance Plant site operated from 1942 to 1956 as a munitions production plant for four bomb loading lines during World War II and the Korean War. The plant also was used for munitions storage and ammonium nitrate production. Some of the processes used organic solvents. Beginning in 1962, portions of the plant were sold to various entities. Today, the major production area of the former plant, approximately 9,000 acres, belongs to the University of Nebraska, which uses it as an agricultural research station. The remaining acreage is owned by the Nebraska National Guard and numerous individuals and corporations. Approximately 400 people obtain drinking water from wells within 3 miles of the site. Groundwater also is used for crop irrigation and livestock watering.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY

Proposed Date: 10/26/89
Final Date: 08/30/90

Threats and Contaminants



The groundwater is contaminated with volatile organic compounds (VOCs) and munitions wastes. The soil also is contaminated with munitions wastes, as well as polychlorinated biphenyls (PCBs). People who have direct contact with or ingest contaminated groundwater or soil may be at risk. In addition, if contaminated groundwater is used for irrigating or watering livestock, the contaminants may accumulate in crops or animals and consumption can pose a health threat.

Cleanup Approach

This site is being addressed in two stages: emergency actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Emergency Actions: In 1989, the U.S. Army determined that a private well was contaminated. The EPA immediately responded by providing the owners with bottled water, which subsequently was provided by the Army. The Army since has installed a carbon filtration system at the residence.



Soils: The Army began conducting an investigation in 1991 to determine the extent of soil contamination at the site. Once the investigation is completed, scheduled for 1993, the results will be evaluated to select the proper technology for cleaning up the soil.



Groundwater: The Army has begun an investigation into the nature and extent of groundwater contamination at the site. The investigation is scheduled for completion in 1995.

Site Facts: The Nebraska Army Ordnance Plant site is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities. An Interagency Agreement between the EPA, State, and Army was signed in 1991.

Environmental Progress



Providing bottled water and subsequently installing a carbon filtration system have eliminated the potential of exposure to hazardous substances in the drinking water while investigations are underway at the Nebraska Army Ordnance Plant site.

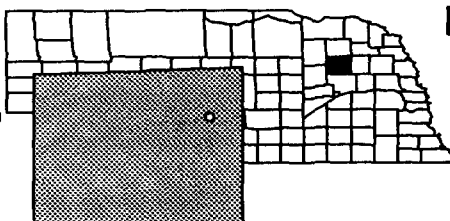
Site Repository



Contact the Region 7 Superfund Community Relations Office.

SHERWOOD MEDICAL CO. NEBRASKA

EPA ID# NED084626100



EPA REGION 7

Madison County
Norfolk

Site Description

The Sherwood Medical Co. site is 115 acres in size and consists of the plant property and nearby wells contaminated with volatile organic compounds (VOCs). Since 1962 Sherwood Medical Co. has manufactured disposable medical supplies. In 1963, treated and untreated wastewater was discharged into unlined disposal ponds located on site. From 1973 to 1986, plastic injection molds were cleaned in two plant areas which had floor drains connected to a septic system. This septic system included a 2,000-gallon buried tank, a concrete settling basin, leach fields, and connecting piping. VOCs were first discovered in 1988, by the EPA, in wastewater discharged to the disposal pond. In 1989, the EPA detected VOCs in the tank and the settling basin. Drums of buried waste solvents also were thought to be buried on site. Local wells were sampled by the EPA and the Nebraska Department of Health from 1987 to 1989. VOCs were detected in Sherwood Well #5, used for industrial purposes, and the main well serving the residences of the Park Mobile Home Court (PMHC). Soil-gas surveys have led site investigators to believe that contaminants are migrating in a north/northeast direction with groundwater flow into PMHC's main well and backup wells. Public and private wells within 4 miles of the site provide drinking water to an estimated 5,900 people. Corn grown for livestock consumption is located on land irrigated by wells within 3 miles of the site. The surrounding area is used for agricultural, residential, and commercial purposes.

Site Responsibility: The site is being addressed through Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 07/29/91

Threats and Contaminants



On site at the plant facility, VOCs were present in the septic system, including the tank and settling basin. Discharges of wastewater to the disposal pond also were found to contain VOCs. Contamination has migrated through the groundwater and is seeping into the water supply of a well used for industrial purposes and the main and backup wells of PMHC.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on soil and groundwater.

Response Action Status



Immediate Actions: In 1988, the EPA supplied the residents of PMHC with bottled water. A carbon treatment system was installed soon after on the PMHC water system, and the EPA discontinued supplying water to the residences. In 1989, PMHC was connected to an uncontaminated well at the same property by Sherwood Medical Co. Other immediate actions taken include removing from service and cleaning the septic tank and settling basin, and rerouting floor drains to the plant's sewage treatment system.



Soil and Groundwater: In 1991, Sherwood Medical Co. initiated an investigation into the nature and extent of soil and groundwater contamination at the site. Studies are expected to be completed and final cleanup remedies selected in 1993.

Site Facts: An Administrative Order on Consent between the EPA and Sherwood Medical Co. was put into effect in August 1989 for the company to perform immediate cleanup actions. An Administrative Order on Consent for the potentially responsible party to investigate site contamination went into effect in March 1991.

Environmental Progress



Immediate actions such as supplying bottled water and installing a carbon treatment system have reduced health and safety risks to the nearby population while Sherwood Medical Co. conducts additional investigations and plans activities for final cleanup of the site.

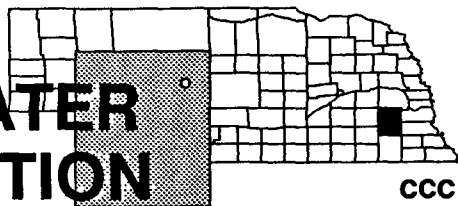
Site Repository



Not established.

WAVERLY GROUND WATER CONTAMINATION NEBRASKA

EPA ID# NED980862718



EPA REGION 7

Lancaster County
Waverly

Other Names:

CCC Commodity Credit Corporation
Hedrick Site

Site Description

The Waverly Ground Water Contamination site extends over an 11-acre area underlying the City of Waverly. The U.S. Department of Agriculture operated a Federal grain facility in Waverly from 1952 to 1974. A grain fumigant consisting of carbon tetrachloride and carbon disulfide was used at the facility from 1955 to 1965. Since 1975, the property has been owned by Lancaster County, which operates a district office and maintenance facility on the premises. The EPA and the State of Nebraska sampled the municipal wells in 1982 and found them to be contaminated. One well was taken out of service, two wells were placed on standby status, and the city drilled new wells to replace them. The area surrounding the site is predominantly agricultural. The population of Waverly is approximately 1,700 people. There is a residential area adjacent to the former grain facility. Several private wells near the site are used for livestock and crop irrigation. Runoff from the site drains into Salt Creek.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 06/10/86

Threats and Contaminants



Samples taken from the municipal wells contained concentrations of heavy metals, volatile organic compounds (VOCs), nitrates, and sulfates. The soil is contaminated with VOCs including carbon tetrachloride and chloroform. Contaminants from the soil have seeped into the aquifer, the source of water for the municipal water supply. The polluted wells were taken out of service, and new wells were drilled; therefore, the municipal water supply is safe to use. The new wells are upgradient of the site and are not likely to be threatened. If contaminated water is used for irrigation or for watering livestock, pollutants may accumulate in the crops or animals, which, if eaten, may pose a health threat to people. Because groundwater discharges into Salt Creek, fish in the creek may be contaminated and cause adverse health effects in people who eat them.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Immediate Actions: In 1988, as an immediate response to the groundwater contamination, the EPA installed groundwater monitoring wells, a system of pipes and wells in the ground connected to a pump to remove vapors contaminating soil (soil gas extraction system), and a groundwater treatment system using air stripping. The groundwater treatment involves forcing a stream of air through the contaminated water to evaporate the chemicals, which then are released into the atmosphere. Air monitoring is conducted to ensure that emissions are within acceptable limits. Treated groundwater is discharged to a ditch near the site. The U.S. Department of Agriculture (USDA) is performing the operation and maintenance on the groundwater extraction and soil gas treatment system. An additional extraction well may be added to the system in 1992 to address contamination discovered outside the influence of the current groundwater extraction well.



Entire Site: The USDA completed an investigation into the nature and extent of contamination at the site. Based on the results of this investigation, the EPA recommended that the immediate actions described above be continued until cleanup of soil and groundwater is achieved. Operation and maintenance of the groundwater treatment system is expected to continue for 6 years.

Environmental Progress



With the groundwater cleanup actions described above underway and new wells providing drinking water to residences, the potential for accidental contact with contaminated groundwater or soil has been reduced while cleanup continues.

Site Repository



Contact the Region 7 Superfund Community Relations Office.

GLOSSARY

Terms Used in the NPL Book

This glossary defines terms used throughout the NPL Volumes. The terms and abbreviations contained in this glossary apply specifically to work performed under the Superfund program in the context of hazardous waste management. These terms may have other meanings when used in a different context. A table of common toxic chemicals found at NPL sites, their sources, and their potential threats is located on page G-15

Acids: Substances, characterized by low pH (less than 7.0), that are used in chemical manufacturing. Acids in high concentration can be very corrosive and react with many inorganic and organic substances. These reactions possibly may create toxic compounds or release heavy metal contaminants that remain in the environment long after the acid is neutralized.

Administrative Order On Consent: A legal and enforceable agreement between the EPA and the parties potentially responsible for site contamination. Under the terms of the Order, the potentially responsible parties (PRPs) agree to perform or pay for site studies or cleanups. It also describes the oversight rules, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. This Order is signed by PRPs and the government; it does not require approval by a judge.

Administrative Order [Unilateral]: A legally binding document issued by the EPA, directing the parties potentially responsible to perform site cleanups or studies (generally, the EPA does not issue Unilateral Orders for site studies). This type of Order is not signed by the PRPs and does not require approval by a judge.

Aeration: A process that promotes breakdown of contaminants in soil or water by exposing them to air.

Agency for Toxic Substances and Disease Registry (ATSDR): The Federal agency within the U.S. Public Health Service charged with carrying out the health-related responsibilities of CERCLA.

Air Stripping: A process whereby volatile organic chemicals (VOCs) are removed from contaminated material by forcing a stream of air through the contaminated material in a pressurized vessel. The contaminants are evaporated into the air stream. The air may be further treated before it is released into the atmosphere.

Ambient Air: Any unconfined part of the atmosphere. Refers to the air that may be inhaled by workers or residents in the vicinity of contaminated air sources.

Applicable or Relevant and Appropriate Requirements (ARARs): Federal, State, or local laws which apply to Superfund activities at NPL sites. Both emergency and long-term actions must comply with these laws or provide sound reasons for allowing a waiver. ARARs must be identified for each site relative to the characteristics of the site, the substances found at the site, or the cleanup alternatives being considered for the site.

GLOSSARY

Aquifer: An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces, or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be tapped and used for drinking or other purposes. The water contained in the aquifer is called groundwater. A "sole source aquifer" supplies 50 percent or more of the drinking water of an area.

Artesian (Well): A well made by drilling into the earth until water is reached, which, due to internal pressure, flows up like a fountain.

Asbestos: A mineral fiber that can pollute air or water and is known to cause cancer or asbestosis when inhaled.

Attenuation: The naturally occurring process by which a compound is reduced in concentration over time through adsorption, degradation, dilution, or transformation.

Background Level: The amount of a substance typically found in the air, water, or soil from natural, as opposed to human, sources.

Baghouse Dust: Dust accumulated in removing particulates from the air by passing it through cloth bags in an enclosure.

Bases: Substances characterized by high pH (greater than 7.0), which tend to be corrosive in chemical reactions. When bases are mixed with acids, they neutralize each other, forming salts.

Berm: A ledge, wall, or a mound of earth used to prevent the migration of contaminants.

Bioaccumulate: The process by which some contaminants or toxic chemicals gradually collect and increase in concentration in living tissue, such as in plants, fish, or people, as they breathe contaminated air, drink contaminated water, or eat contaminated food.

Biological Treatment: The use of bacteria or other microbial organisms to break down toxic organic materials into carbon dioxide and water.

Bioremediation: A cleanup process using naturally occurring or specially cultivated microorganisms to digest contaminants and break them down into non-hazardous components.

Bog: A type of wetland that is covered with peat moss deposits. Bogs depend primarily on moisture from the air for their water source, are usually acidic, and are rich in plant residue [see Wetland].

Boom: A floating device used to contain oil floating on a body of water or to restrict the potential overflow of waste liquids from containment structures.

Borehole: A hole that is drilled into the ground and used to sample soil or ground-water.

Borrow Pit: An excavated area where soil, sand, or gravel has been dug up for use elsewhere.

Cap: A layer of material, such as clay or a synthetic material, used to prevent rainwater from penetrating and spreading contaminated materials. The surface of the cap generally is mounded or sloped so water will drain off.

Carbon Adsorption: A treatment system in which contaminants are removed from ground-water and surface water by forcing water through tanks containing activated carbon, a specially treated material that attracts and holds or retains contaminants.

Carbon Disulfide: A degreasing agent formerly used extensively for parts washing. This compound has both inorganic and organic

properties, which increase cleaning efficiency. However, these properties also cause chemical reactions that increase the hazard to human health and the environment.

Carbon Treatment: [see Carbon Adsorption].

Cell: In solid waste disposal, one of a series of holes in a landfill where waste is dumped, compacted, and covered with layers of dirt.

CERCLA: [see Comprehensive Environmental Response, Compensation, and Liability Act].

Characterization: The sampling, monitoring, and analysis of a site to determine the extent and nature of toxic releases. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Chemical Fixation: The use of chemicals to bind contaminants, thereby reducing the potential for leaching or other movement.

Chromated Copper Arsenate: An insecticide/herbicide formed from salts of three toxic metals: copper, chromium, and arsenic. This salt is used extensively as a wood preservative in pressure-treating operations. It is highly toxic and water-soluble, making it a relatively mobile contaminant in the environment.

Cleanup: Actions taken to eliminate a release or threat of release of a hazardous substance. The term "cleanup" sometimes is used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Closure: The process by which a landfill stops accepting wastes and is shut down under Federal

guidelines that ensure the protection of the public and the environment.

Comment Period: A specific interval during which the public can review and comment on various documents and EPA actions related to site cleanup. For example, a comment period is provided when the EPA proposes to add sites to the NPL. Also, there is minimum 3-week comment period for community members to review and comment on the remedy proposed to clean up a site.

Community Relations: The EPA effort to establish and maintain two-way communication with the public. The goals of community relations programs include creating an understanding of EPA programs and related actions, assuring public input into decision-making processes related to affected communities, and making certain that the Agency is aware of, and responsive to, public concerns. Specific community relations activities are required in relation to Superfund cleanup actions [see Comment Period].

Comprehensive Environmental Response, Compensation, and Liability

Act (CERCLA): Congress enacted the CERCLA, known as Superfund, in 1980 to respond directly to hazardous waste problems that may pose a threat to the public health and the environment. The EPA administers the Superfund program.

Confluence: The place where two bodies of water, such as streams or rivers, come together.

Confined Aquifer: An aquifer in which groundwater is confined under pressure that is significantly greater than atmospheric pressure.

GLOSSARY

Consent Decree: A legal document, approved and issued by a judge, formalizing an agreement between the EPA and the parties potentially responsible for site contamination. The decree describes cleanup actions that the potentially responsible parties are required to perform, or the costs incurred by the government that the parties will reimburse, and the roles, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. If a settlement between the EPA and a potentially responsible party includes cleanup actions, it must be in the form of a Consent Decree. A Consent Decree is subject to a public comment period.

Consent Order: [see Administrative Order on Consent].

Containment: The process of enclosing or containing hazardous substances in a structure, typically in a pond or a lagoon, to prevent the migration of contaminants into the environment.

Contaminant: Any physical, chemical, biological, or radiological material or substance whose quantity, location, or nature produces undesirable health or environmental effects.

Contingency Plan: A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or other accident that releases toxic chemicals, hazardous wastes, or radioactive materials into the environment.

Cooperative Agreement: A contract between the EPA and the States, wherein a State agrees to manage or monitor certain site cleanup responsibilities and other activities on a cost-sharing basis.

Cost Recovery: A legal process by which potentially responsible parties can be required to pay back the Superfund program for money

it spends on any cleanup actions [see Potentially Responsible Parties].

Cover: Vegetation or other material placed over a landfill or other waste material. It can be designed to reduce movement of water into the waste and to prevent erosion that could cause the movement of contaminants.

Creosotes: Chemicals used in wood preserving operations and produced by distillation of tar, including polycyclic aromatic hydrocarbons and polynuclear aromatic hydrocarbons [see PAHs and PNAs]. Contaminating sediments, soils, and surface water, creosotes may cause skin ulcerations and cancer through prolonged exposure.

Culvert: A pipe used for drainage under a road, railroad track, path, or through an embankment.

Decommission: To revoke a license to operate and take out of service.

Degradation: The process by which a chemical is reduced to a less complex form.

Degrease: To remove grease from wastes, soils, or chemicals, usually using solvents.

Deletion: A site is eligible for deletion from the NPL when Superfund response actions at the site are complete. A site is deleted from the NPL when a notice is published in the Federal Register.

De minimis: This legal phrase pertains to settlements with parties who contributed small amounts of hazardous waste to a site. This process allows the EPA to settle with small, or *de minimis* contributors, as a single group rather than as individuals, saving time, money, and effort.

Dewater: To remove water from wastes, soils, or chemicals.

Dike: A low wall that can act as a barrier to prevent a spill from spreading.

Dioxin: An organic chemical by-product of pesticide manufacture which is known to be one of the most toxic man-made chemicals.

Disposal: Final placement or destruction of toxic, radioactive, or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, or incineration.

Downgradient: A downward hydrologic slope that causes groundwater to move toward lower elevations. Therefore, wells *downgradient* of a contaminated groundwater source are prone to receiving pollutants.

Ecological Assessment: A study of the impact of man-made or natural activity on living creatures and their environment.

Effluent: Wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Emission: Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities.

Emulsifiers: Substances that help in mixing materials that do not normally mix; e.g., oil and water.

Endangerment Assessment: A study conducted to determine the risks posed to public health or the environment by contamination at NPL sites. The EPA or the State conducts the study when a legal action is to be taken to direct the potentially responsible parties to clean up a site or pay for the cleanup. An endangerment

assessment supplements an investigation of the site hazards.

Enforcement: EPA, State, or local legal actions taken against parties to facilitate settlements; to compel compliance with laws, rules, regulations, or agreements; or to obtain penalties or criminal sanctions for violations. Enforcement procedures may vary, depending on the specific requirements of different environmental laws and related regulatory requirements. Under CERCLA, for example, the EPA will seek to require potentially responsible parties to clean up a Superfund site or pay for the cleanup [see Cost Recovery].

Erosion: The wearing away of land surface by wind or water. Erosion occurs naturally from weather or surface runoff, but can be intensified by such land-related practices as farming, residential or industrial development, road building, or timber-cutting. Erosion may spread surface contamination to off-site locations.

Estuary (estuarine): Areas where fresh water from rivers and salt water from nearshore ocean waters are mixed. These areas may include bays, mouths of rivers, salt marshes, and lagoons. These water ecosystems shelter and feed marine life, birds, and wildlife.

Evaporation Ponds: Areas where sewage sludge or other watery wastes are dumped and allowed to dry out.

Feasibility Study: The analysis of the potential cleanup alternatives for a site. The feasibility study usually starts as soon as the remedial investigation is underway. In this volume, the feasibility study is referred to as a site study [see also Remedial Investigation].

GLOSSARY

Filtration: A treatment process for removing solid (particulate) matter from water by passing the water through sand, activated carbon, or a man-made filter. The process is often used to remove particles that contain contaminants.

Flood Plain: An area along a river, formed from sediment deposited by floods. Flood plains periodically are inundated by natural floods, which can spread contamination.

Flue Gas: The air that is emitted from a chimney after combustion in the burner occurs. The gas can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, particles, and many chemical pollutants.

Fly Ash: Non-combustible residue that results from the combustion of flue gases. It can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, as well as many other chemical pollutants.

French Drain System: A crushed rock drain system constructed of perforated pipes, which is used to drain and disperse wastewater.

Gasification (coal): The conversion of soft coal into gas for use as a fuel.

General Notice Letter: [See Notice Letter].

Generator: A facility that emits pollutants into the air or releases hazardous wastes into water or soil.

Good Faith Offer: A voluntary offer, generally in response to a Special Notice letter, made by a potentially responsible party, consisting of a written proposal demonstrating a potentially responsible party's qualifications and willingness to perform a site study or cleanup.

Groundwater: Water that fills pores in soils or openings in rocks to the point of saturation. In aquifers, groundwater occurs in sufficient

quantities for use as drinking and irrigation water and other purposes.

Groundwater Quality Assessment: The process of analyzing the chemical characteristics of groundwater to determine whether any hazardous materials exist.

Halogens: Reactive non-metals, such as chlorine and bromine. Halogens are very good oxidizing agents and, therefore, have many industrial uses. They are rarely found by themselves; however, many chemicals such as polychlorinated biphenyls (PCBs), some volatile organic compounds (VOCs), and dioxin are reactive because of the presence of halogens.

Hazard Ranking System (HRS): The principal screening tool used by the EPA to evaluate relative risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites. The HRS calculates a score based on the potential of hazardous substances spreading from the site through the air, surface water, or groundwater and on other factors such as nearby population. The HRS score is the primary factor in deciding if the site should be on the NPL.

Hazardous Waste: By-products of society that can pose a substantial present or potential hazard to human health and the environment when improperly managed. Hazardous waste possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Heavy Metals: Metallic elements with high atomic weights, such as arsenic, lead, mercury, and cadmium. Heavy metals are very hazardous even at low concentrations and tend to accumulate in the food chain.

Herbicide: A chemical pesticide designed to control or destroy plants, weeds, or grasses.

Hot Spot: An area or vicinity of a site containing exceptionally high levels of contamination.

Hydrocarbons: Chemical compounds that consist entirely of hydrogen and carbon.

Hydrology: The properties, distribution, and circulation of water.

Hydrogeology: The geology of groundwater, with particular emphasis on the chemistry and movement of water.

Impoundment: A body of water or sludge confined by a dam, dike, floodgate, or other barrier.

Incineration: A group of treatment technologies involving destruction of waste by controlled burning at high temperatures, e.g., burning sludge to reduce the remaining residues to a non-burnable ash that can be disposed of safely on land, in some waters, or in underground locations.

Infiltration: The movement of water or other liquid down through soil from precipitation (rain or snow) or from application of wastewater to the land surface.

Influent: Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant.

Injection Well: A well into which waste fluids are placed, under pressure, for purposes of disposal.

Inorganic Chemicals: Chemical substances of mineral origin, not of basic carbon structure.

Installation Restoration Program: The specially funded program established in 1978 under which the Department of Defense has been identifying and evaluating its hazardous waste sites and controlling the migration of hazardous contaminants from those sites.

Intake: The source from where a water supply is drawn, such as from a river or water body.

Interagency Agreement: A written agreement between the EPA and a Federal agency that has the lead for site cleanup activities, setting forth the roles and responsibilities of the agencies for performing and overseeing the activities. States often are parties to interagency agreements.

Interim (Permit) Status: Conditions under which hazardous waste treatment, storage, and disposal facilities, that were operating when regulations under the RCRA became final in 1980, are temporarily allowed by the EPA to continue to operate while awaiting denial or issuance of a permanent permit. The facility must comply with certain regulations to maintain interim status.

Lagoon: A shallow pond or liquid waste containment structure. Lagoons typically are used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel.

Landfarm: To apply waste to land or incorporate waste into the surface soil, such as fertilizer or soil conditioner. This practice commonly is used for disposal of composted wastes and sludges.

Landfill: A disposal facility where waste is placed in or on land. *Sanitary* landfills are disposal sites for non-hazardous solid wastes. The waste is spread in layers, compacted to the smallest practical volume, and covered with soil at the end of each operating day. *Secure chemical* landfills are disposal sites for hazardous waste. They are designed to minimize the chance of release of hazardous substances into the environment [see Resource Conservation and Recovery Act].

Leach, Leaching [v.t.]: The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

GLOSSARY

Leachate [n]: The liquid that trickles through or drains from waste, carrying soluble components from the waste.

Leachate Collection System: A system that gathers liquid that has leaked into a landfill or other waste disposal area and pumps it to the surface for treatment.

Liner: A relatively impermeable barrier designed to prevent leachate (waste residue) from leaking from a landfill. Liner materials include plastic and dense clay.

Long-term Remedial Phase: Distinct, often incremental, steps that are taken to solve site pollution problems. Depending on the complexity, site cleanup activities can be separated into several of these phases.

Long-term Response Action: An action which requires a continuous period of on-site activity before cleanup goals are achieved. These actions typically include the extraction and treatment of groundwater and monitoring actions.

Marsh: A type of wetland that does not contain peat moss deposits and is dominated by vegetation. Marshes may be either fresh or saltwater and tidal or non-tidal [see Wetland].

Migration: The movement of oil, gas, contaminants, water, or other liquids through porous and permeable soils or rock.

Mill Tailings: [See Mine Tailings].

Mine Tailings: A fine, sandy residue left from mining operations. Tailings often contain high concentrations of lead, uranium, and arsenic or other heavy metals.

Mitigation: Actions taken to improve site conditions by limiting, reducing, or controlling toxicity and contamination sources.

Modeling: A technique using a mathematical or physical representation of a system or theory that tests the effects that changes on system components have on the overall performance of the system.

Monitoring Wells: Special wells drilled at specific locations within, or surrounding, a hazardous waste site where groundwater can be sampled at selected depths and studied to obtain such information as the direction in which groundwater flows and the types and amounts of contaminants present.

National Priorities List (NPL): The EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term cleanup under Superfund. The EPA is required to update the NPL at least once a year.

Natural Attenuation: [See Attenuation].

Neutrals: Organic compounds that have a relatively neutral pH, complex structure and, due to their organic bases, are easily absorbed into the environment. Water is the most commonly known neutral, however, naphthalene, pyrene, and trichlorobenzene also are examples of neutrals.

Nitroaromatics: Common components of explosive materials, which will explode if activated by very high temperatures or pressures; 2,4,6-Trinitrotoluene (TNT) is a nitroaromatic.

Notice Letter: A General Notice Letter notifies the parties potentially responsible for site contamination of their possible liability. A Special Notice Letter begins a 60-day formal period of negotiation during which the EPA is not allowed to start work at a site or initiate enforcement actions against potentially responsible parties, although the EPA may undertake certain investigatory and planning activities.

GLOSSARY

The 60-day period may be extended if the EPA receives a good faith offer from the PRPs within that period. [See also Good Faith Offer].

On-Scene Coordinator (OSC): The predesignated EPA, Coast Guard, or Department of Defense official who coordinates and directs Superfund removal actions or Clean Water Act oil- or hazardous-spill corrective actions.

Operation and Maintenance: Activities conducted at a site after a cleanup action is completed to ensure that the cleanup or containment system is functioning properly.

Organic Chemicals/Compounds: Chemical substances containing mainly carbon, hydrogen, and oxygen.

Outfall: The place where wastewater is discharged into receiving waters.

Overpacking: Process used for isolating large volumes of waste by jacketing or encapsulating waste to prevent further spread or leakage of contaminating materials. Leaking drums may be contained within oversized barrels as an interim measure prior to removal and final disposal.

Pentachlorophenol (PCP): A synthetic, modified petrochemical that may be used as a wood preservative because of its toxicity to termites and fungi. It is a common component of creosotes and can cause cancer.

Perched (groundwater): Groundwater separated from another underlying body of groundwater by a confining layer, often clay or rock.

Percolation: The downward flow or filtering of water or other liquids through subsurface rock or soil layers, usually continuing downward to groundwater.

Pesticide: A substance or mixture of substances intended to prevent, destroy, or repel any pest. If misused, pesticides can accumulate in the foodchain and contaminate the environment.

Petrochemicals: Chemical substances produced from petroleum in refinery operations and as fuel oil residues. These include fluoranthene, chrysene, mineral spirits, and refined oils. Petrochemicals are the bases from which volatile organic compounds (VOCs), plastics, and many pesticides are made. These chemical substances often are toxic to humans and the environment.

Phenols: Organic compounds that are used in plastics manufacturing and are by-products of petroleum refining, tanning, textile, dye, and resin manufacturing. Phenols are highly poisonous.

Physical Chemical Separation: The treatment process of adding a chemical to a substance to separate the compounds for further treatment or disposal.

Pilot Testing: A small-scale test of a proposed treatment system in the field to determine its ability to clean up specific contaminants.

Plugging: The process of stopping the flow of water, oil, or gas into or out of the ground through a borehole or well penetrating the ground.

Plume: A body of contaminated groundwater flowing from a specific source. The movement of the groundwater is influenced by such factors as local groundwater flow patterns, the character of the aquifer in which groundwater is contained, and the density of contaminants [see Migration].

Pollution: Generally, the presence of matter or energy whose nature, location, or quantity produces undesired health or environmental effects.

GLOSSARY

Polycyclic Aromatic Hydrocarbons or Polyaromatic Hydrocarbons (PAHs):

PAHs, such as pyrene, are a group of highly reactive organic compounds found in motor oil. They are a common component of creosotes and can cause cancer.

Polychlorinated Biphenyls (PCBs): A group of toxic chemicals used for a variety of purposes including electrical applications, carbonless copy paper, adhesives, hydraulic fluids, microscope immersion oils, and caulking compounds. PCBs also are produced in certain combustion processes. PCBs are extremely persistent in the environment because they are very stable, non-reactive, and highly heat resistant. Chronic exposure to PCBs is believed to cause liver damage. It also is known to bioaccumulate in fatty tissues. PCB use and sale was banned in 1979 with the passage of the Toxic Substances Control Act.

Polynuclear Aromatic Hydrocarbons (PNAs): PNAs, such as naphthalene, and biphenyls, are a group of highly reactive organic compounds that are a common component of creosotes, which can be carcinogenic.

Polyvinyl Chloride (PVC): A plastic made from the gaseous substance vinyl chloride. PVC is used to make pipes, records, raincoats, and floor tiles. Health risks from high concentrations of vinyl chloride include liver cancer and lung cancer, as well as cancer of the lymphatic and nervous systems.

Potable Water: Water that is safe for drinking and cooking.

Potentially Responsible Parties (PRPs):

Parties associated with a Superfund site who may be liable for the cost of remedying the release of hazardous substances. This may include owners or operators of the site or transporters who disposed of materials at the site. PRPs may admit liability, or liability may be determined by a court of law. PRPs may sign a

Consent Decree or Administrative Order on Consent to participate in the site cleanup without admitting liability.

Precipitation: The removal of solids from liquid waste so that the solid and liquid portions can be disposed of safely; the removal of particles from airborne emissions. Electrochemical precipitation is the use of an anode or cathode to remove the hazardous chemicals. Chemical precipitation involves the addition of some substance to cause the solid portion to separate.

Preliminary Assessment: The process of collecting and reviewing available information about a known or suspected waste site or release to determine if a threat or potential threat exists.

Pump and Treat: A groundwater cleanup technique involving the extracting of contaminated groundwater from the subsurface and the removal of contaminants, using one of several treatment technologies.

Radionuclides: Elements, including radium and uranium-235 and -238, which break down and produce radioactive substances due to their unstable atomic structure. Some are man-made, and others are naturally occurring in the environment. Radon, the gaseous form of radium, decays to form alpha particle radiation, which cannot be absorbed through skin. However, it can be inhaled, which allows alpha particles to affect unprotected tissues directly and thus cause cancer. Radiation also occurs naturally through the breakdown of granite.

RCRA: [See Resource Conservation and Recovery Act].

Recharge Area: A land area where rainwater saturates the ground and soaks through the earth to reach an aquifer.

Record of Decision (ROD): A public document that explains which cleanup alternative(s) will be used to clean up sites listed on the NPL. It is based on information generated during the remedial investigation and feasibility study and consideration of public comments and community concerns.

Recovery Wells: Wells used to withdraw contaminants or contaminated groundwater.

Recycle: The process of minimizing waste generation by recovering usable products that might otherwise become waste.

Remedial Action (RA): The actual construction or implementation phase of a Superfund site cleanup following the remedial design [see Cleanup].

Remedial Design: A phase of site cleanup where engineers design the technical specifications for cleanup remedies and technologies.

Remedial Investigation: An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site, establish the criteria for cleaning up the site, identify the preliminary alternatives for cleanup actions, and support the technical and cost analyses of the alternatives. The remedial investigation is usually done with the feasibility study. In this volume, the remedial investigation is referred to as a site study [see also Feasibility Study].

Remedial Project Manager (RPM): The EPA or State official responsible for overseeing cleanup actions at the site.

Remedy Selection: The selection of the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining con-

tamination will be naturally dispersed without further cleanup activities, a "No Action" remedy is selected [see Record of Decision].

Removal Action: Short-term immediate actions taken to address releases of hazardous substances [see Cleanup].

Residual: The amount of a pollutant remaining in the environment after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment, or the particulates remaining in air after the air passes through a scrubber.

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Retention Pond: A small body of liquid used for disposing of wastes and containing overflow from production facilities. Sometimes retention ponds are used to expand the capacity of such structures as lagoons the store waste.

Runoff: The discharge of water over land into surface water. It can carry pollutants from the air and land and spread contaminants from its source.

Scrubber: An air pollution control device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.

Sediment: The layer of soil, sand, and minerals at the bottom of surface waters such as streams, lakes, and rivers, that absorbs contaminants.

GLOSSARY

Seeps: Specific points where releases of liquid, usually leachate, form from waste disposal areas, particularly along the lower edges of landfills.

Seepage Pits: A hole, shaft, or cavity in the ground used for the storage of liquids, usually in the form of leachate, from waste disposal areas. The liquid gradually leaves the pit by moving through the surrounding soil.

Septage: Residue remaining in a septic tank after the treatment process.

Sinkhole: A hollow depression in the land surface in which drainage collects; associated with underground caves and passages that facilitate the movement of liquids.

Site Characterization: The technical process used to evaluate the nature and extent of environmental contamination, which is necessary for choosing and designing cleanup measures and monitoring their effectiveness.

Site Inspection: The collection of information from a hazardous waste site to determine the extent and severity of hazards posed by the site. It follows, and is more extensive than, a preliminary assessment. The purpose is to gather information necessary to score the site, using the Hazard Ranking System, and to determine if the site presents an immediate threat that requires a prompt removal action.

Slag: The fused refuse or dross separated from a metal in the process of smelting.

Sludge: Semi-solid residues from industrial or water treatment processes that may be contaminated with hazardous materials.

Slurry Wall: Barriers used to contain the flow of contaminated groundwater or subsurface

liquids. Slurry walls are constructed by digging a trench around a contaminated area and filling the trench with an impermeable material that prevents water from passing through it. The groundwater or contaminated liquids trapped within the area surrounded by the slurry wall can be extracted and treated.

Smelter: A facility that melts or fuses ore, often with an accompanying chemical change, to separate the metal. Emissions from smelters are known to cause pollution.

Soil Gas: Gaseous elements and compounds that occur in the small spaces between particles of soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

Soil Vapor Extraction: A treatment process that uses vacuum wells to remove hazardous gases from soil.

Soil Washing: A water-based process for mechanically scrubbing soils in-place to remove undesirable materials. There are two approaches: dissolving or suspending them in the wash solution for later treatment by conventional methods, and concentrating them into a smaller volume of soil through simple particle size separation techniques [see Solvent Extraction].

Stabilization: The process of changing an active substance into inert, harmless material, or physical activities at a site that act to limit the further spread of contamination without actual reduction of toxicity.

Solidification/Stabilization: A chemical or physical reduction of the mobility of hazardous constituents. Mobility is reduced through the binding of hazardous constituents into a solid mass with low permeability and resistance to leaching.

Solvent: A substance capable of dissolving another substance to form a solution. The primary uses of industrial solvents are as cleaners for degreasing, in paints, and in pharmaceuticals. Many solvents are flammable and toxic to varying degrees.

Solvent Extraction: A means of separating hazardous contaminants from soils, sludges, and sediment, thereby reducing the volume of the hazardous waste that must be treated. It generally is used as one in a series of unit operations. An organic chemical is used to dissolve contaminants as opposed to water-based compounds, which usually are used in soil washing.

Sorption: The action of soaking up or attracting substances. It is used in many pollution control systems.

Special Notice Letter: [See Notice Letter].

Stillbottom: Residues left over from the process of recovering spent solvents.

Stripping: A process used to remove volatile contaminants from a substance [see Air Stripping].

Sumps: A pit or tank that catches liquid runoff for drainage or disposal.

Superfund: The program operated under the legislative authority of the CERCLA and Superfund Amendments and Reauthorization Act (SARA) to update and improve environmental laws. The program has the authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health, welfare, or the environment. The "Superfund" is a trust fund that finances cleanup actions at hazardous waste sites.

Surge Tanks: A holding structure used to absorb irregularities in flow of liquids, including liquid waste materials.

Swamp: A type of wetland that is dominated by woody vegetation and does not accumulate peat moss deposits. Swamps may be fresh or saltwater and tidal or non-tidal [see Wetlands].

Thermal Treatment: The use of heat to remove or destroy contaminants from soil.

Treatability Studies: Testing a treatment method on contaminated groundwater, soil, etc., to determine whether and how well the method will work.

Trichloroethylene (TCE): A stable, colorless liquid with a low boiling point. TCE has many industrial applications, including use as a solvent and as a metal degreasing agent. TCE may be toxic to people when inhaled, ingested, or through skin contact and can damage vital organs, especially the liver [see Volatile Organic Compounds].

Unilateral [Administrative] Order: [see Administrative Order].

Upgradient: An upward hydrologic slope; demarks areas that are higher than contaminated areas and, therefore, are not prone to contamination by the movement of polluted groundwater.

Vacuum Extraction: A technology used to remove volatile organic compounds (VOCs) from soils. Vacuum pumps are connected to a series of wells drilled to just above the water table. The wells are sealed tightly at the soil surface, and the vacuum established in the soil draws VOC-contaminated air from the soil pores into the well, as fresh air is drawn down from the surface of the soil.

GLOSSARY

Vegetated Soil Cap: A cap constructed with graded soils and seed for vegetative growth, to prevent erosion [see Cap].

Vitrification: The process of electrically melting wastes and soils or sludges to bind the waste in a glassy, solid material more durable than granite or marble and resistant to leaching.

Volatile Organic Compounds (VOCs): VOCs are manufactured as secondary petrochemicals. They include light alcohols, acetone, trichloroethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential exposure to humans. Due to their low water solubility, environmental persistence, and widespread industrial use, they are commonly found in soil and groundwater.

Waste Treatment Plant: A facility that uses a series of tanks, screens, filters, and other treatment processes to remove pollutants from water.

Wastewater: The spent or used water from individual homes or industries.

Watershed: The land area that drains into a stream or other water body.

Water Table: The upper surface of the groundwater.

Weir: A barrier to divert water or other liquids.

Wetland: An area that is regularly saturated by surface or groundwater and, under normal circumstances, is capable of supporting vegetation typically adapted for life in saturated soil conditions. Wetlands are critical to sustaining many species of fish and wildlife. Wetlands generally include swamps, marshes, and bogs. Wetlands may be either coastal or inland. Coastal wetlands have salt or brackish (a mixture of salt and fresh) water, and most have tides, while inland wetlands are non-tidal and freshwater. Coastal wetlands are an integral component of estuaries.

Wildlife Refuge: An area designated for the protection of wild animals, within which hunting and fishing are either prohibited or strictly controlled.

Some Common Contaminants at NPL Sites

Contaminant Category	Example Chemical Types	Sources	Potential Health Threats*
Heavy Metals	Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Chromium, Lead, Manganese, Mercury, Nickel, Silver, Selenium, Zinc	Electroplating, batteries, paint pigments, photography, smelting, thermometers, fluorescent lights, solvent recovery	Tumors, cancers, and kidney, brain, neurological, bone and liver damage
Volatile Organic Compounds (VOCs)	Trichloroethylene (TCE), Perchloroethylene (PCE), Acetone, Benzene, Ketone, Methyl chloride, Toluene, Vinyl Chloride, Dichloroethylene	Solvents and degreasers, gasoline octane enhancers, oils and paints, dry cleaning fluids, chemical manufacturing.	Cancers, kidney and liver damage, impairment of the nervous system resulting in sleepiness and headaches, leukemia
Pesticides/Herbicides	Chlordane, DDT 4-4, DDE, Heptachlor, Aldrin, Endrin, Atrazine, Dieldrin, Toxaphene	Agricultural applications, pesticide and herbicide production	Various effects ranging from nausea to nervous disorders. Dioxin is a common by-product of the manufacture of pesticides and is both highly toxic and a suspected carcinogen.
Polychlorinated biphenyls (PCBs)	—	Electric transformers and capacitors, insulators and coolants, adhesives, caulking compounds, carbonless copy paper, hydraulic fluids.	Cancer and liver damage.
Creosotes	Polyaromatic hydrocarbons (PAHs), Polynuclear aromatics (PNAs), Phenolic Tars, Pentachlorophenol (PCP)	Wood preserving, fossil fuel combustion	Cancers and skin ulcerations with prolonged exposure
Radiation (Radionuclides)	Radium-226, Radon, Uranium-235, Uranium-238	Mine tailings, radium products, natural decay of granites	Cancer

Sources: *Toxic Chemicals—What They Are, How They Affect You (EPA, Region 5)*
Glossary of Environmental Terms (EPA, 1988)

*The potential for risk due to these contaminants is linked to a number of factors; for example, the length and level of exposure and environmental and health factors such as age.